

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims:

1. (currently amended) A method of forming an optical communication path, comprising:
 - a) creating a channel within a planar layer in ~~of~~ a first substrate of a multi-layered printed circuit board (PCB) and within a planar layer in ~~of~~ a second substrate of the multi-layered PCB;
 - b) forming at least a portion of an optical path within the channel of the first and second substrates, the first and second substrates being stacked together in the multi-layered PCB; and
 - c) optically coupling with a switch the channel in the first substrate with the channel in the second substrate.
2. (original) The method of claim 1 wherein step a) further comprises creating the channel using a selected one of a chemical, mechanical, and a thermal process to remove planar layer material.
3. (original) The method of claim 1 wherein step a) comprises molding the planar layer with the channel.
4. (original) The method of claim 1 wherein step a) further comprises:
 - i) lithographically defining a location of the optical path on a face of the planar layer; and
 - ii) etching the planar layer along the defined location of the optical path to create the channel.
5. (original) The method of claim 1 wherein step b) further comprises filling the channel with an optical core medium.

6. (original) The method of claim 1 wherein step b) further comprises:
 - i. depositing a first cladding portion within the channel; and
 - ii. depositing an optical core medium within the channel; and
 - iii. depositing a second cladding portion over the optical core medium.
7. (original) The method of claim 6 wherein one of the first and second cladding portions has an index of refraction less than an optical core medium index of refraction.
8. (original) The method of claim 6 wherein at least one of the first and second cladding portions is optically reflective along a side adjacent the optical core medium.
9. (original) The method of claim 1 further comprising:
 - i. depositing a cladding portion within the channel; and
 - ii. depositing an optical core medium within the channel.
10. (original) The method of claim 9 wherein the cladding portion has an index of refraction less than an optical core medium index of refraction.
11. (original) The method of claim 9 wherein the cladding portion is optically reflective along a side adjacent the optical core medium.
12. (original) The method of claim 1 wherein the planar layer is a selected one of a conductor, nonconductor, and semiconductor layer.
13. (original) The method of claim 1 wherein walls of the channel have a lower index of refraction than that of the optical core medium.
14. (original) The method of claim 1 wherein the optical path is substantially non-cylindrical.

15. (original) The method of claim 1, further comprising:

- c) forming an electrical trace supported by the planar layer.

16. (currently amended) A method of forming an optical communication path, comprising:

- a) providing a first ~~substrate-board~~ with a first planar layer having a channeled face defining a first channel formed in the first ~~substrate-board~~;
- b) providing a second ~~substrate-board~~ with a second planar layer having a complementary channeled face defining a second channel formed in the second ~~substrate-board~~;
- c) placing the first and second planar layers such that the first and complementary second channels oppose each other to form a composite channel defining the optical path in a multi-layered printed circuit board; and
- d) providing vias through the first and second planar layers to connect the composite channel with different optical pathways extending through different vertically stacked layers of the multi-layered printed circuit board.

17. (original) The method of claim 16 further comprising applying a reflective coating to the first and second planar layers.

18. (original) The method of claim 16 further comprising depositing an optical core medium within the first and second channels.

19. (original) The method of claim 16 further comprising filling the composite channel with an optical core medium.

20. (original) The method of claim 16 further comprising applying a reflecting coating over the first and second channels.

21. (original) The method of claim 16 wherein the first and second channels have a semi-circular cross-section.

22. (original) The method of claim 16 wherein one of the first and second channels is created through a selected one of a chemical, mechanical, or thermal process applied to a planar layer.

23. (original) The method of claim 16 wherein one of the first and second planar layers is molded with its respective channel.

24. — 49. (canceled)

50. (previously presented) The method of claim 1 further comprising:

d) switching the switch between an opaque state that prevents passage of an optical signal and a transparent state that permits passage of the optical signal.